



# APPLICATIONS – Computational Optics

The background of the slide features a dark, star-filled space scene. In the center-right, there is a bright, multi-pointed star or diffraction pattern. To its left, a small, dark, spherical object resembling a planet or moon is visible against the starlight. The overall atmosphere is deep space-themed.

**Computational Optics:**  
Wavefront Control, Interferometry and Coronagraphy

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Advanced Telescopes & Observatories  
Capabilities & Mission Drivers Roadmapping  
B22/rm 396, December 1, 2, 2004

<http://code935.gsfc.nasa.gov/cube%20Folder/OSCAR/index.html>



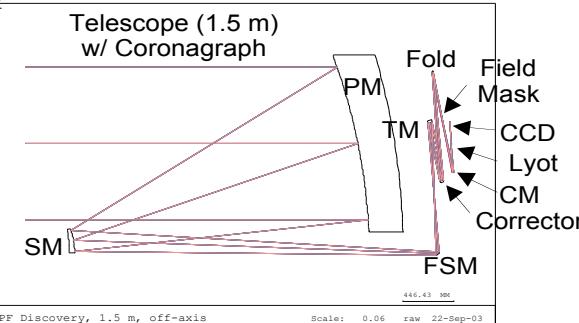
# APPLICATIONS – Computational Optics

## OSCAR Modeling Coronagraphic Telescope Example

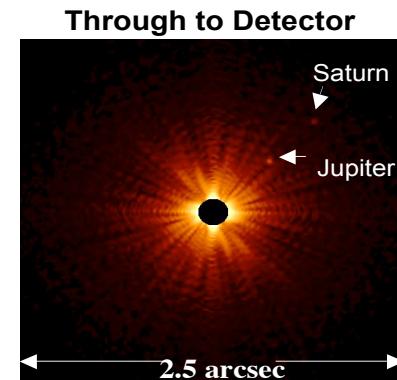
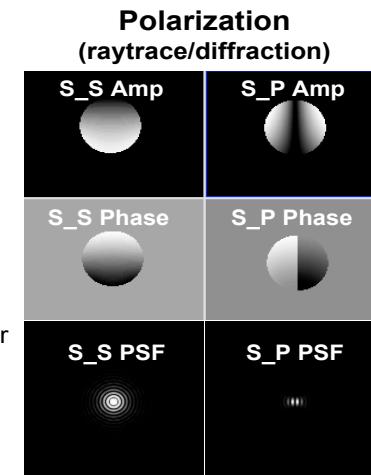
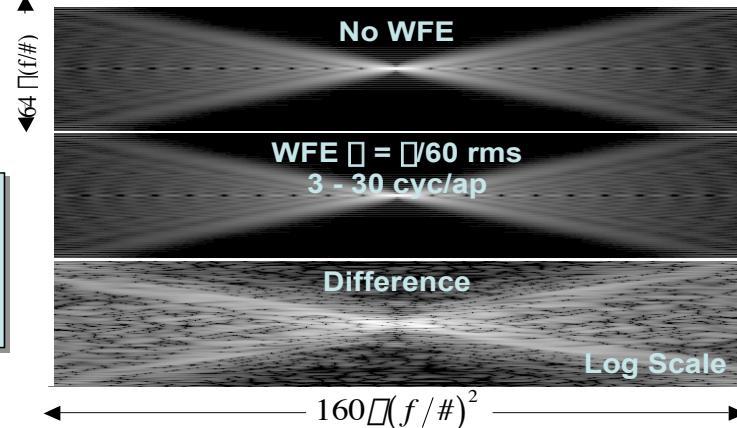
R.G. Lyon  
12/1-2/04

### Optical Systems Characterization And Analysis Research Software

- Developed over 17 years (R. Lyon)
- Parallel C/MPI on Beowulf clusters
- OSCAR:
  - Dense polarization raytrace
  - Multiple plane diffraction w/polarization
  - Aberrations, detector, speckle/scatter,
  - WFS, Optical Control, DMs etc...
- Models:
  - Telescopes, Coronagraphs
  - Interferometers, Hypertelescopes
- Not easy to use:
  - Translate Zemax or Code V prescription
  - No GUI
  - Used by R. Lyon

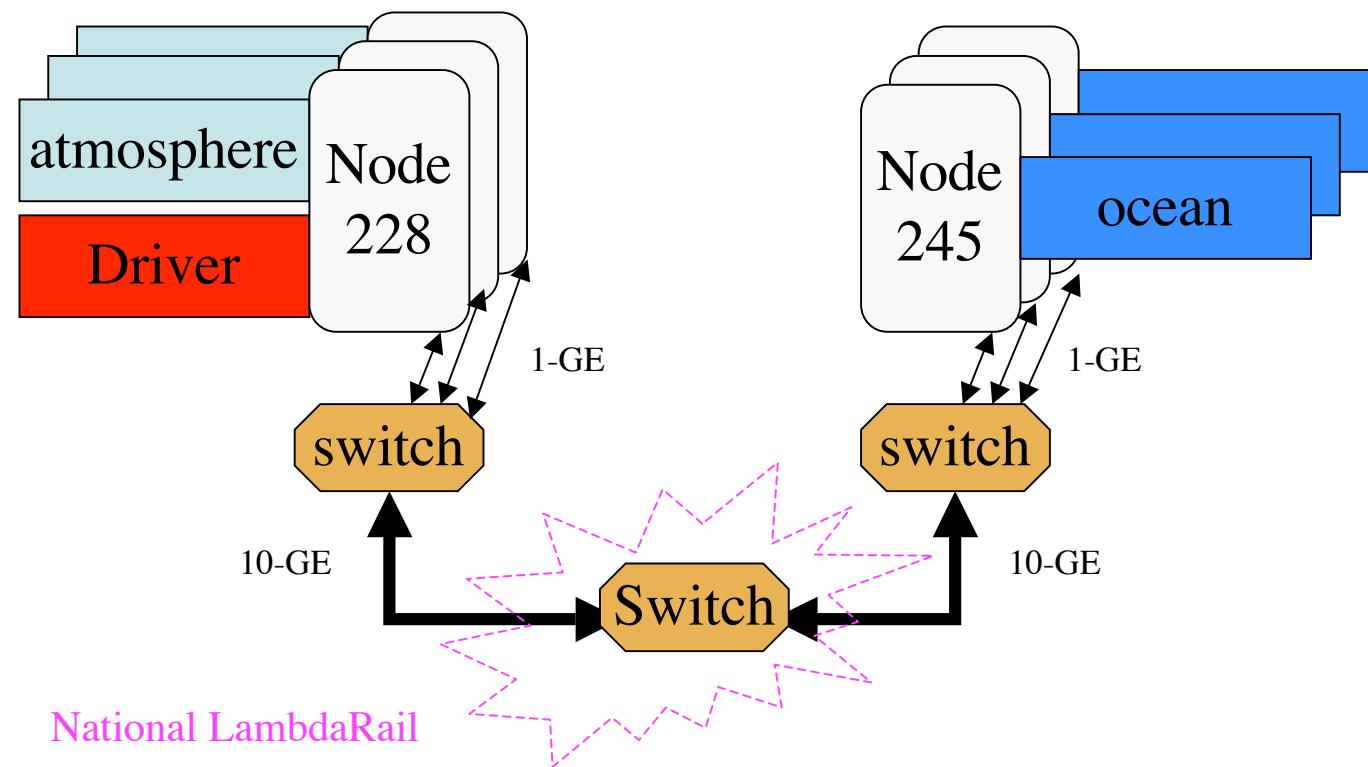


No commercial code has OSCAR's capabilities





# APPLICATIONS – GRID on 10gE



Dr. Shujia Zhou (Northrop Grumman/TASC) demonstrates a prototype of the Grid-enabled ESMF based on DOE's CCA/XCAT framework across a 10gE link among nodes in Thunderhead connected via the Lambda Net. This implementation is a follow-up to the effort that Zhou described in more detail at <http://esto.nasa.gov/conferences/estc2004/papers/a4p1.pdf>.